

115 KAR 2:020. Income tax credit for active solar, passive solar, wind, and geothermal energy systems.

RELATES TO: KRS Chapter 141

STATUTORY AUTHORITY: KRS 141.380(9), 152A.180

NECESSITY, FUNCTION, AND CONFORMITY: The administrative regulation has been developed by the Kentucky Energy Cabinet to assure uniformity in the administration of its duties to certify that energy systems installed are viable, and to maintain commonly accepted energy equipment standards which effectively conform to the statutory definition of qualifying energy property. The administrative regulation sets forth administrative procedures, requirements and standards for determining whether property is used to generate power from solar radiation, wind, or geothermal energy as defined by KRS 141.375 so as to qualify for an income tax credit. The program will complement actions by the Kentucky Revenue Cabinet in allowing eligible taxpayers to claim tax credits on their income tax returns.

Section 1. Definition. (1) "Qualifying energy property" means property used to generate power from solar radiation, wind, or geothermal energy. This term includes the components of active solar systems, passive solar systems, wind energy systems and geothermal energy systems, as defined in subsections (2) through (5) of this section.

(2) "Active solar system" means a system of equipment capable of collecting and converting solar radiation into thermal, mechanical or electrical energy, and of transferring these forms of energy to storage or the point of use. It includes water heating, space heating or cooling, and the generation of electrical or mechanical energy. Transfer or storage components are included, except for those which would be required regardless of the energy source being used.

(3) "Passive solar system" means a direct thermal system which utilizes the structure of a building and its operable components to collect, store and distribute heating or cooling during the appropriate times of the year, by utilizing the climate resources available at the site. It includes those portions or components of a building that are expressly designed and required for the collection, storage and distribution of solar energy. Structural components of a building which also are used as part of the energy system, such as supporting walls used also for heat storage, are included only if and to the extent that their cost exceeds that of conventional construction. Multipurpose components shall include but not be limited to windows or attached greenhouses, if designed as part of a solar system and if south facing. Multipurpose components shall be included for half of their cost.

(4) "Wind energy system" means a system of equipment capable of intercepting and converting wind energy into mechanical or electrical energy and of transferring these forms of energy to the point of use or storage. It does not include those storage or transfer components which would be required regardless of the energy source being used. Wind equipment used to produce power for transportation is excluded.

(5) "Geothermal energy system" means a system of equipment necessary to transmit or use natural heat from the earth to provide hot water, produce electricity or generate heating or cooling for use within a building. This includes hydrothermal energy systems. It does not include those storage or transfer components which would be required regardless of the energy source being used.

(6) "Solar cells" (including photovoltaics) means a system of equipment which converts solar energy directly into electrical energy, and is capable of transferring this form of energy to the point of use or storage, or to the point of connection to the conventional electrical system.

(7) "Glazing" means transparent material, such as glass or ultraviolet resistant thermoplastics, which has a minimum transmissivity of .71.

(8) "Heat sink" means a body or substance, such as earth or water, used for the disposal of heat in the course of a hydrodynamic or thermodynamic process.

(9) "Solarium" means a room or space, which is part of a building, having south-facing glazing such as an atrium, sun porch, attached greenhouse, or sun space, and includes the means to utilize and/or distribute heat it has generated.

Section 2. Active Solar Systems. Qualifying systems must be one (1) of the following types - heating and cooling systems or electrical generation systems.

(1) Heating and cooling systems.

(a) An active heating and cooling solar system consists of components which convert solar radiation to thermal energy, and transport the thermal energy to storage, and/or to the point of use or connection to the conventional system. While the design, operation, and performance of active heating and cooling systems may vary, to qualify the system must include the following functions:

1. The means for collecting sunlight to heat liquids or air. The glazing surface must face within thirty (30) degrees due south.
2. The means for absorbing the sun's heat from the collecting surface to heat liquids or air.
3. The means for circulating or transferring the energy from the heated liquid or air.

(b) Any components which are designed as part of the heating and cooling system and are reasonably necessary for its efficient and useful operation will qualify. Such components may include but are not limited to the following:

1. Storage mediums, such as tanks to store hot liquids or rock beds to store heat from the air;
2. Differential thermostats to activate fans and pumps that circulate the hot liquid or hot air; and
3. Heat exchangers which utilize hot liquids or hot air to transfer heat to liquid or air used for heating and/or cooling a building.

(2) Electrical generation systems.

(a) An electrical generation system must include conversion of solar radiation to electrical energy and the collection and transmission of the electrical energy to storage, or to the point of use or connection to the electrical system. The solar cell system to qualify must include the following components:

1. A solar cell array and any devices required to mount the cell array. The solar cells must face within thirty (30) degrees due south.
2. Electrical transmission components extending from the solar cells to storage, and/or to the point of use, or connection to the conventional system.

(b) Any components which are designed as part of the solar cell system and are reasonably necessary for its efficient and useful operation will qualify. Such components may include but are not limited to the following:

1. An inverter which converts electricity from direct current (DC) to alternating (AC);
2. Safety equipment required by a utility company, if the system is feeding electricity into a utility system; and
3. Any device used to store the electrical energy, if storage is needed to delay the use of the energy produced.

Section 3. Passive Solar Systems. (1) To qualify as a passive solar system, the system must consist of south facing glazing, storage mass where necessary to prevent overheating, and a method of isolating the storage mass from the outdoor climatic conditions. A passive solar system must utilize the materials which form the enclosure to collect, store, and distribute the solar energy, usually by nonmechanical means. Qualifying systems must be one (1) of the following types - direct gain passive solar systems, indirect gain passive solar systems, or attached solariums.

(a) To qualify as a direct gain passive solar system, the following conditions must be met:

1. The glazing must face within thirty (30) degrees of due south (except when the glazing is slanted, then the angle deviation from due south may be such that the equivalent solar radiation between

9 a.m. and 3 p.m. (solar time) is at least equal to vertical glazing facing within thirty (30) degrees of due south);

2. Sufficient storage mass must exist which represents the minimum heat storage capacity required by the ratio of the passive solar glazing area to the floor area of the direct gain space. The minimum heat storage capacity must be equivalent to .06 cubic feet of concrete or masonry, or .17 gallons of water per square foot of floor area of the direct gain space. Where the ratio of the passive solar glazing area to the floor area of the direct gain space does not exceed sixteen (16) percent, additional storage mass beyond normal home furnishings and wall finishes is not required; and

3. Movable insulation of at least R-3 value must be available to shield the glazing, or the solar collection surface must be double glazed.

(b) To qualify as an indirect gain passive solar system, the following conditions must be met:

1. The glazing must face within thirty (30) degrees of due south (except when the glazing is slanted, then the angle deviation from due south may be such that the equivalent solar radiation between 9 a.m. and 3 p.m. (solar time) is at least equal to vertical glazing facing within thirty (30) degrees of due south); and

2. Indirect gain passive solar systems include but are not limited to thermosiphon collectors (also known as dayheaters) and Trombe walls.

(c) To qualify as a solarium, the following conditions must be met:

1. The glazing must face within thirty (30) degrees of due south (except when the glazing is slanted, then the angle deviation from due south may be such that the equivalent solar radiation between 9 a.m. and 3 p.m. (solar time) is at least equal to vertical glazing facing within thirty (30) degrees of due south);

2. A mechanism must exist to transport the excess heat to the conditioned environment;

3. Sufficient storage mass must exist which represents the minimum heat storage capacity required by the ratio of the passive solar glazing area to the solarium floor area. The minimum heat storage capacity must be equivalent to .33 cubic feet of concrete or masonry, or 1.04 gallons of water per each square foot of glazing; and

4. The solarium must be thermally isolated from the conditioned space by an equivalent R-3 insulation, or R-3 movable insulation must be available to cover the glazed area, or the glazed area must be double glazed.

(2) Any components which are designed as part of the passive solar systems as described in this section and are reasonably necessary for its efficient and useful operation will qualify. Such components may include but are not limited to the following:

(a) Glazing materials and other materials to seal the glazing, and the supporting structure for the glazing.

(b) Storage mass may include:

1. Floors if built of masonry, slate, or other appropriate materials, if insulated around the perimeter or underneath the floor.

2. Walls if built of masonry, water, or other thermal storage materials.

(c) Movable insulation if it has an equivalent of R-3 or greater insulating value and is sealed around the edges. Included are ropes, tracks, pulleys, motors, and other devices for the movement and/or storage of insulation, provided that the sole purpose of these items is to move and store the insulation.

(d) Devices for controlling heat loss or heat gain, or for distributing heat. Such devices may include awnings, overhangs, shade screens, attached lattice work, and fans.

Section 4. Wind Energy Systems. (1) A qualifying wind energy system must be a nonmobile system and must extract energy from the movement of air caused by the uneven heating of the earth from the sun. The system of equipment must be capable of intercepting and converting wind energy

into thermal mechanical or electrical energy, and of transferring these forms of energy to storage, or to the point of use, or connection to the conventional system. Wind energy systems must include the following components:

- (a) A device which collects the energy from the wind, such as blades, rotors, and hubs;
- (b) A mechanism which transmits the collected energy, such as gearbox, shaft, and bearings; and
- (c) A mechanism which transforms the energy to mechanical, electrical or thermal energy, such as generators and pony breaks.

(2) Any components which are designed as part of the wind energy system and are reasonably necessary for its efficient operation will qualify. Such components may include but are not limited to the following:

- (a) A tower or other supporting structure, if the purpose of the structure is solely to support and house the equipment in subsection (1) of this section. If an existing structure is used to mount the wind machine, then only the modifications necessary for the installation of the wind machine are eligible;

- (b) A device used to store the energy, if storage is needed to delay the use of the energy produced; and

- (c) Safety equipment required by a utility company, if the wind system is feeding electricity into a utility system.

Section 5. Geothermal Energy Systems. (1) A geothermal energy system must use a thermal exchange with the earth to transmit or use natural heat from the earth to provide hot water, produce electricity, or generate heating and/or cooling for use within a building. The system of equipment must be capable of converting energy from the earth and transferring the energy to storage, or to the point of use, or connection to the conventional system. Qualifying systems include the following types:

- (a) Ground water to air heat pumps, in which a heat pump uses ground or surface water as the source when space heating, and the heat sink when space cooling;

- (b) Earth coil systems, in which pipes are buried in the ground, either vertically or horizontally, and a fluid is pumped through the pipes.

- (c) A closed system, where a heat pump uses a stored water unit as the source and a heat sink; in such case, the storage unit must be in contact with the earth and below the frost line (twenty-four (24) to thirty (30) inches), and must be of sufficient size that it will not freeze solid during the heating season.

(2) Any components which are designed as part of the geothermal system and are reasonably necessary for its efficient operation will qualify. Such components may include but are not limited to: heat pump equipment (excluding duct work), the water subsystem, well drilling, trenching, well capacity tests, and wiring.

Section 6. Comparable Systems. The minimum requirements set forth in the administrative regulation may be waived by the Kentucky Energy Cabinet if the applicant can clearly show that the overall performance and efficiency of his/her system of relevant components is equal to or greater than a system or relevant components which meet the minimum requirement stated in this administrative regulation.

Section 7. Application Procedures. (1) Any taxpayer seeking certification of a qualifying energy property for purposes on an income tax credit under KRS 141.380 shall complete and file an application with the Kentucky Energy Cabinet. An application form will be provided by the Kentucky Energy Cabinet and the application shall include:

- (a) Documentary proof of expenditures for the purchase and installation of the qualified energy

property. Expenditures must be itemized for each component of the system. Labor expenditures must also be itemized.

(b) Documentary proof that the system is completely installed as of the date of the application.

(c) Identification of supplier(s) and laborer(s).

(2) Upon receipt of a complete and properly documented application, the Kentucky Energy Cabinet shall evaluate it to determine whether the system and components are qualifying energy property.

(3) If the Kentucky Energy Cabinet determines that the energy property qualifies for the tax credit, the Kentucky Energy Cabinet shall issue a qualified energy property certificate to the applicant for the energy property components which qualify for a tax credit.

(4) If the Kentucky Energy Cabinet determines that no certificate will be issued, the Kentucky Energy Cabinet shall notify the applicant in writing of this decision.

(5) The Kentucky Energy Cabinet may take up to sixty (60) days to review and act on an application for certification of an energy property.

(6) An applicant may request reconsideration of the decision of the Kentucky Energy Cabinet by submitting a written request together with any additional documentation or support which can be offered.

(7) The Kentucky Energy Cabinet may make information available to the Kentucky Revenue Cabinet for its determination of the amount of credit to which the applicant is entitled. (11 Ky.R. 306; Am. 550; eff. 10-9-84.)